

Flip chip components

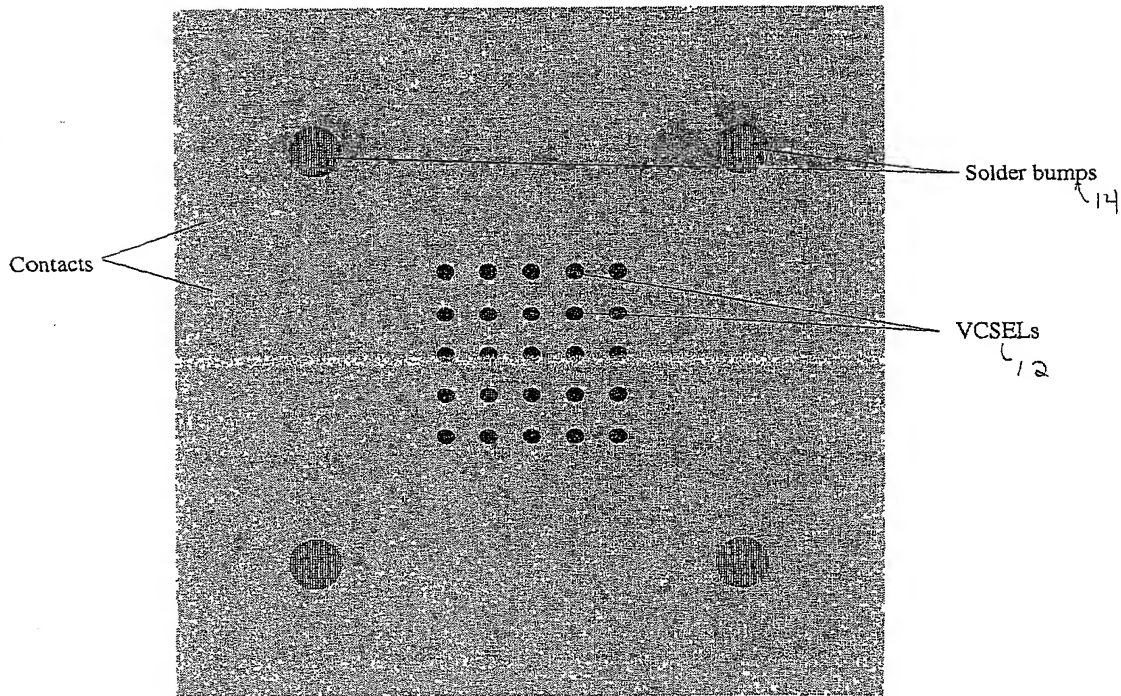


Figure 1A

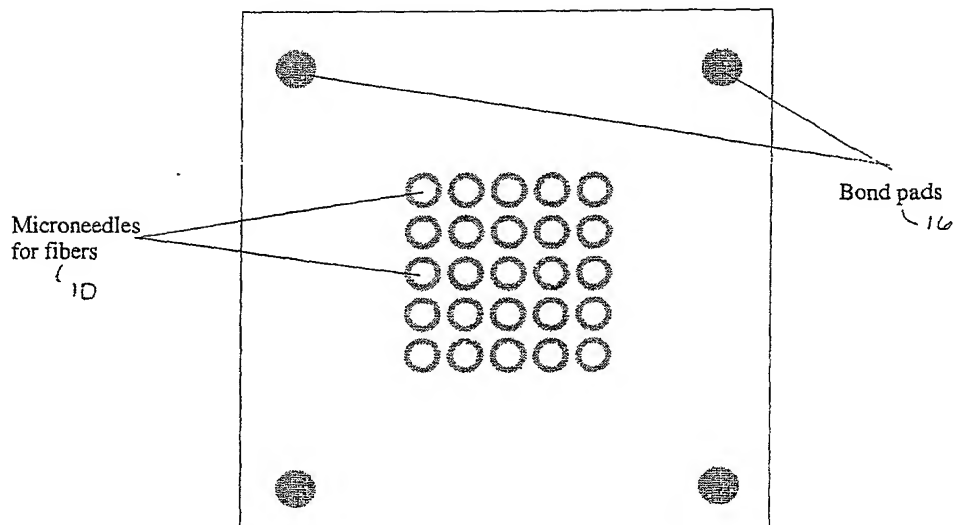


Figure 1B

Flip Chip Assembly Drawing

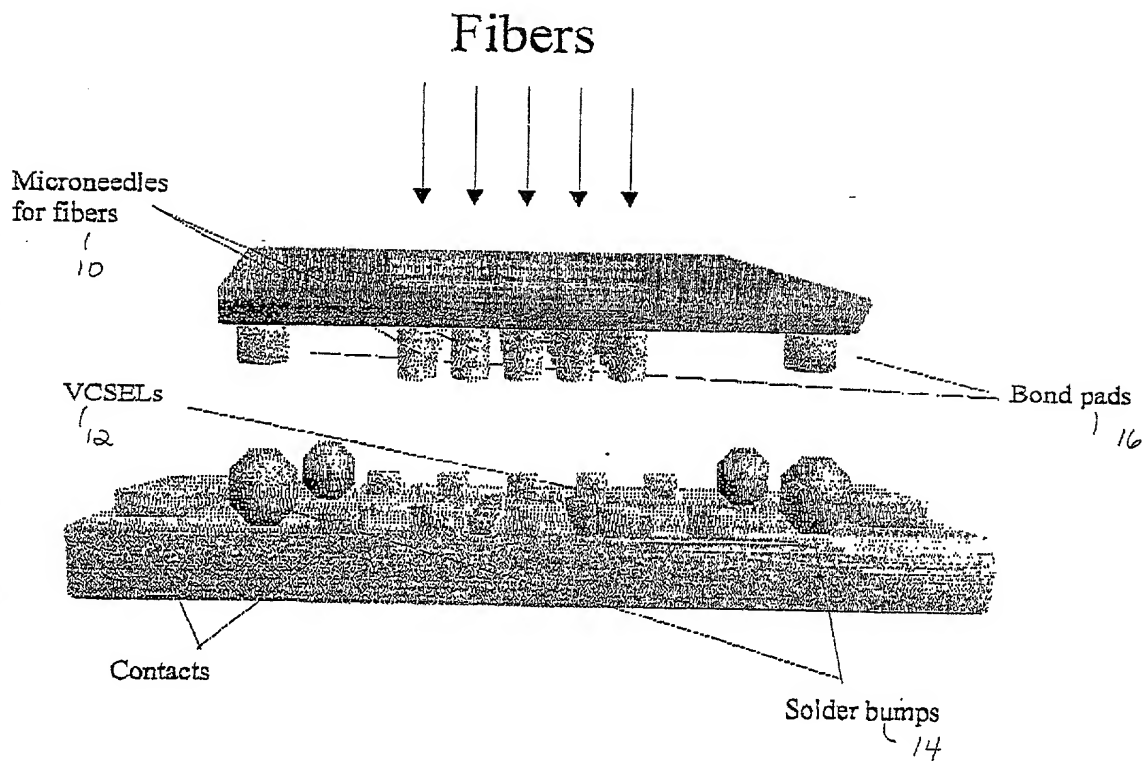


Figure 20

Metal Microneedle Fabrication Process

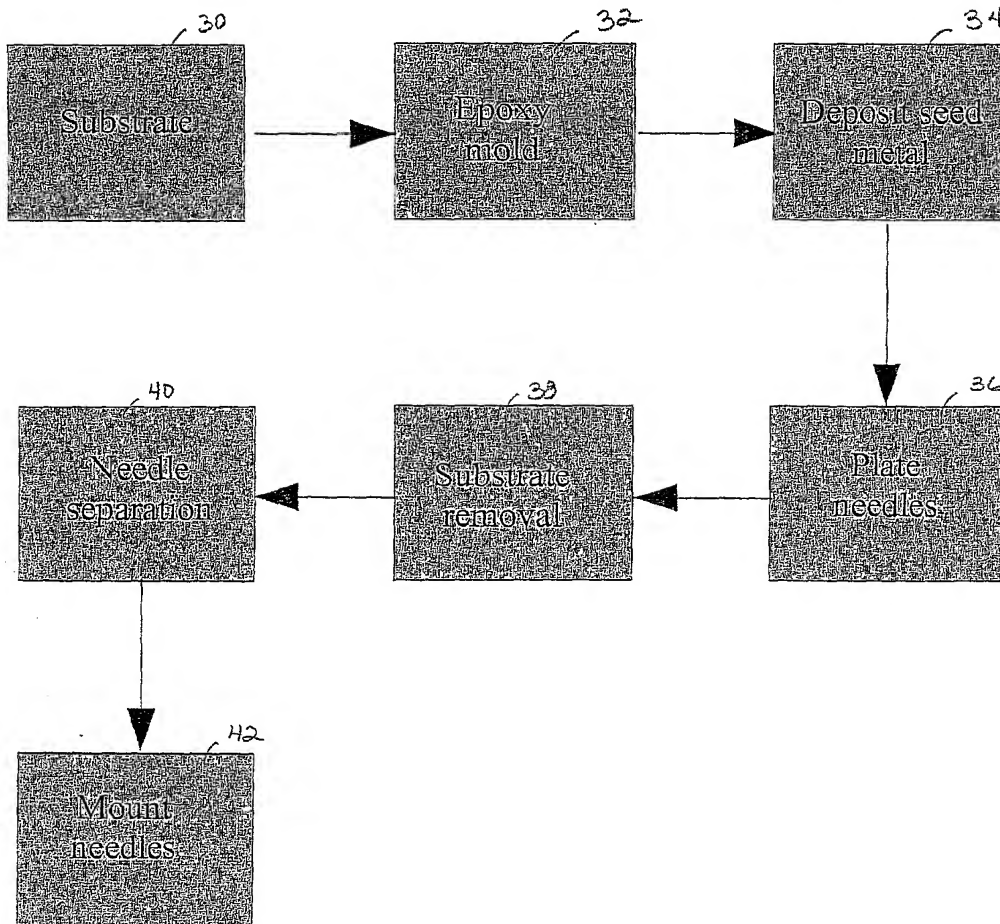


Figure 3A

Fiber/VCSEL Assembly Process

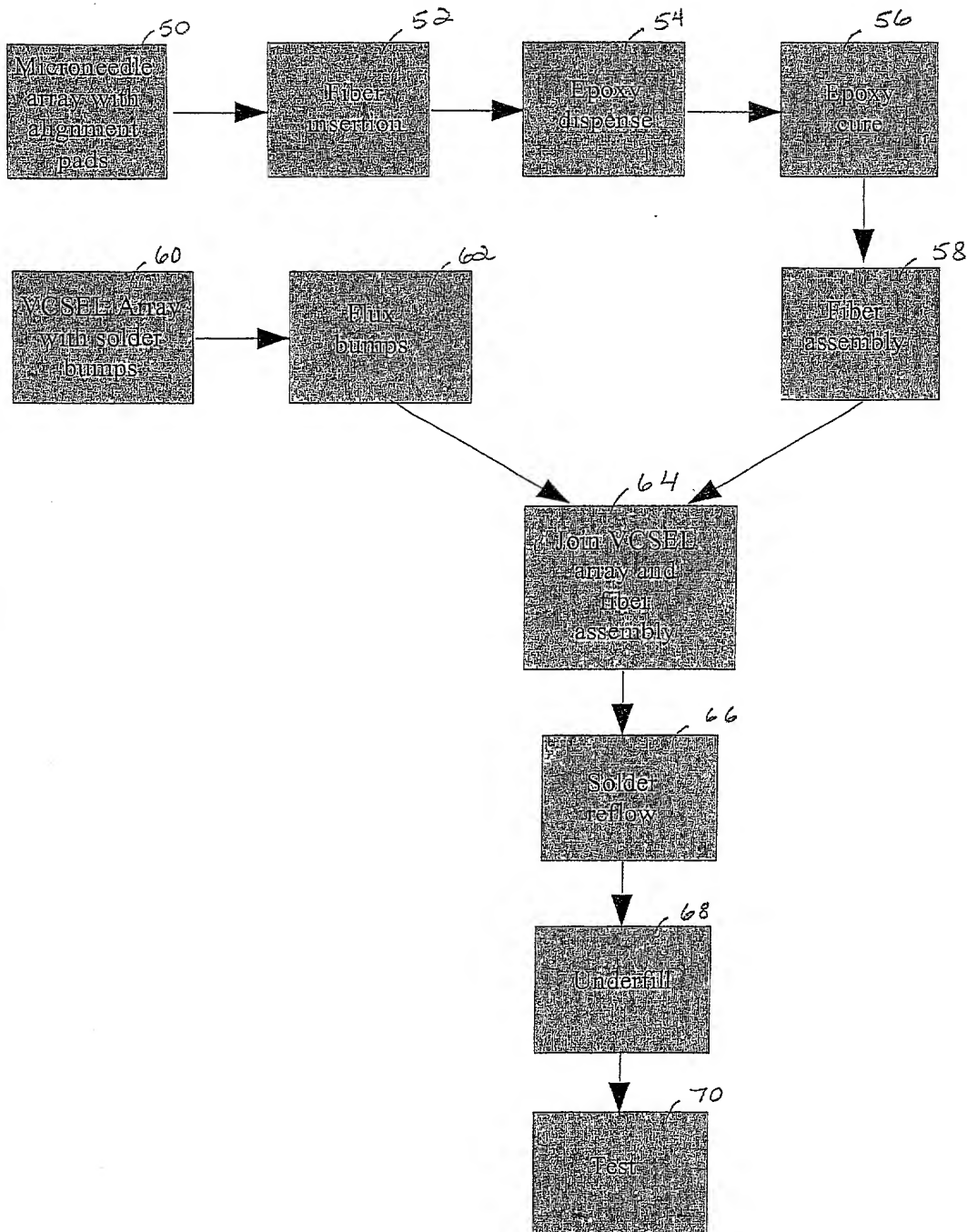


Figure 3B

Fiber Assembly Cross-Sections

Fiber in Needles

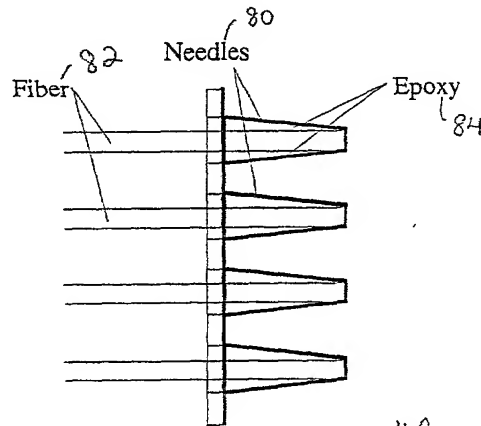


Figure 4A

Fiber w/ Epoxy Plug

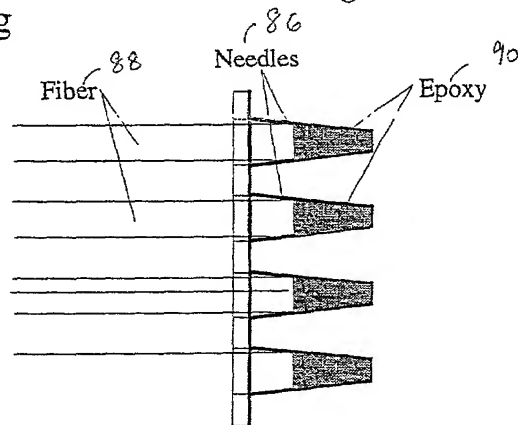


Figure 4B

Fiber w/ epoxy lens

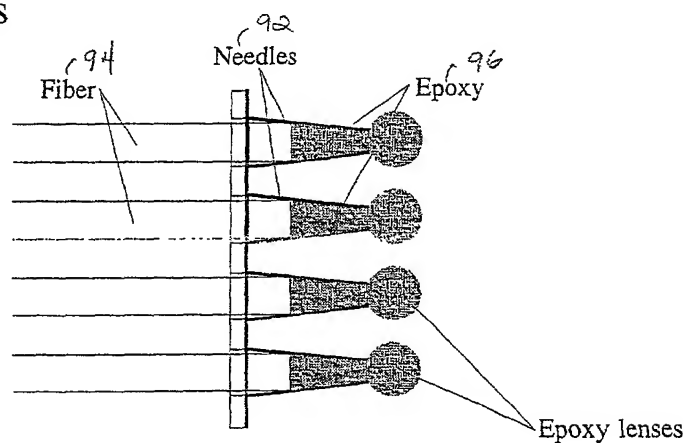
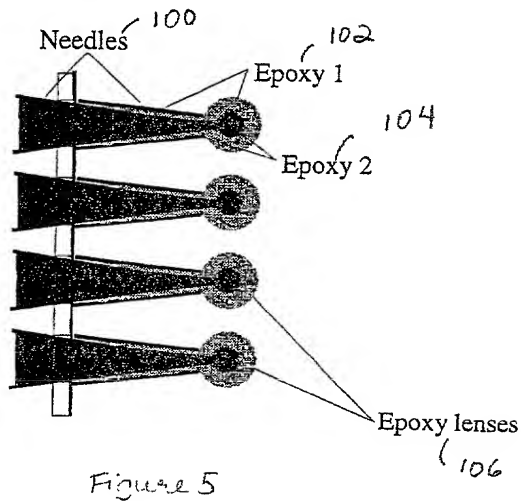
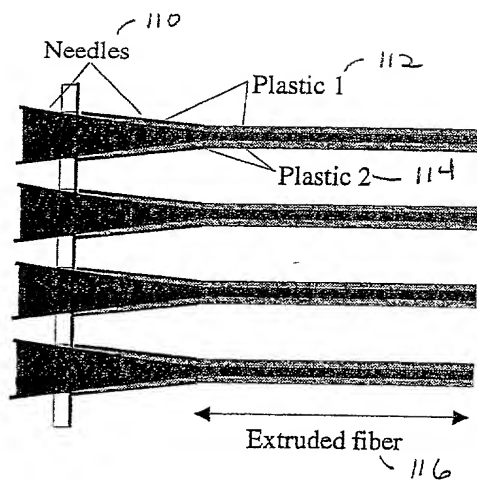


Figure 4C

Fiber w/ graded epoxy lens



Micro-extrusion



Connector-Fiber to Laser

Before insertion

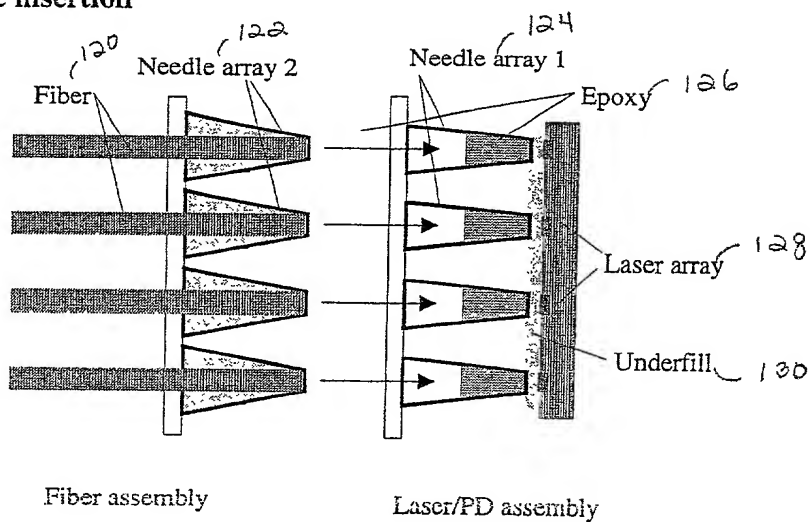


Figure 7A

After insertion

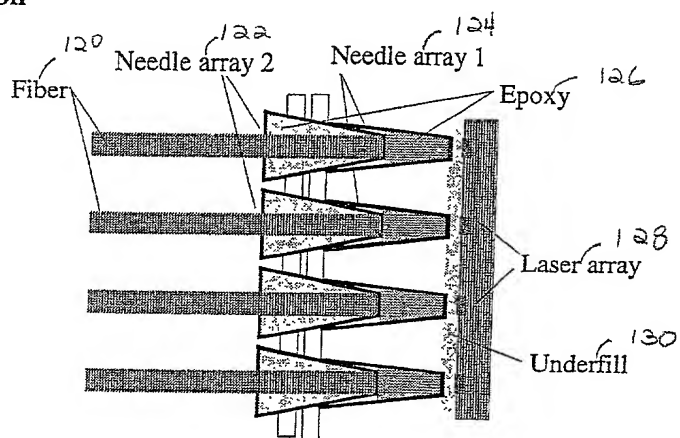


Figure 7B

Lensed Fiber Connector

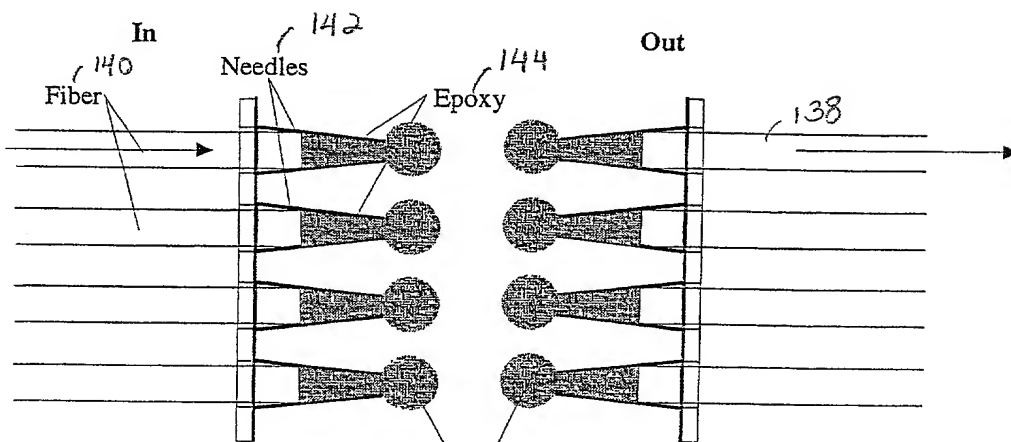


Figure 8

Un-lensed Fiber Connector

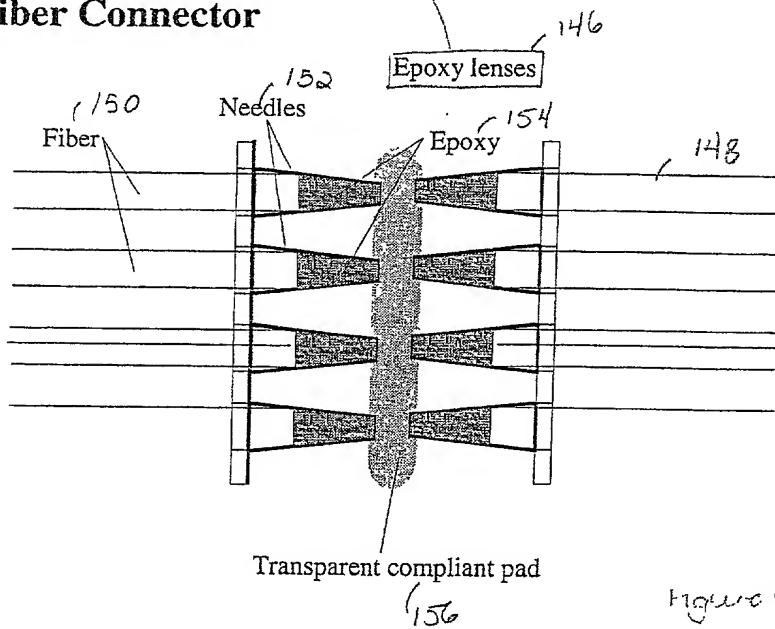


Figure 9

Lensed Fiber Connector w/ Alignment Spacer

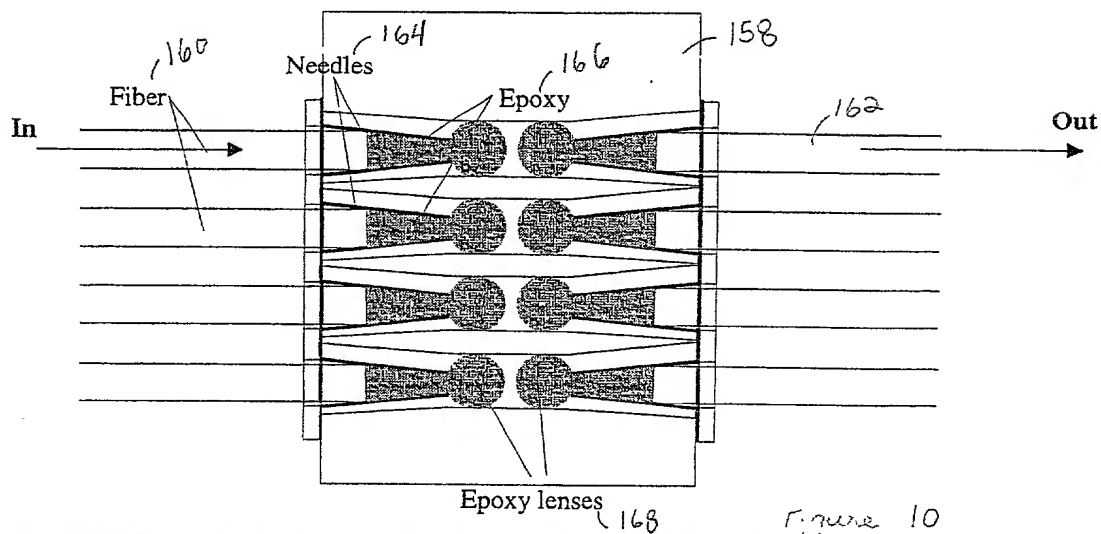


Figure 10

Un-lensed Fiber Connector w/ Alignment Spacer

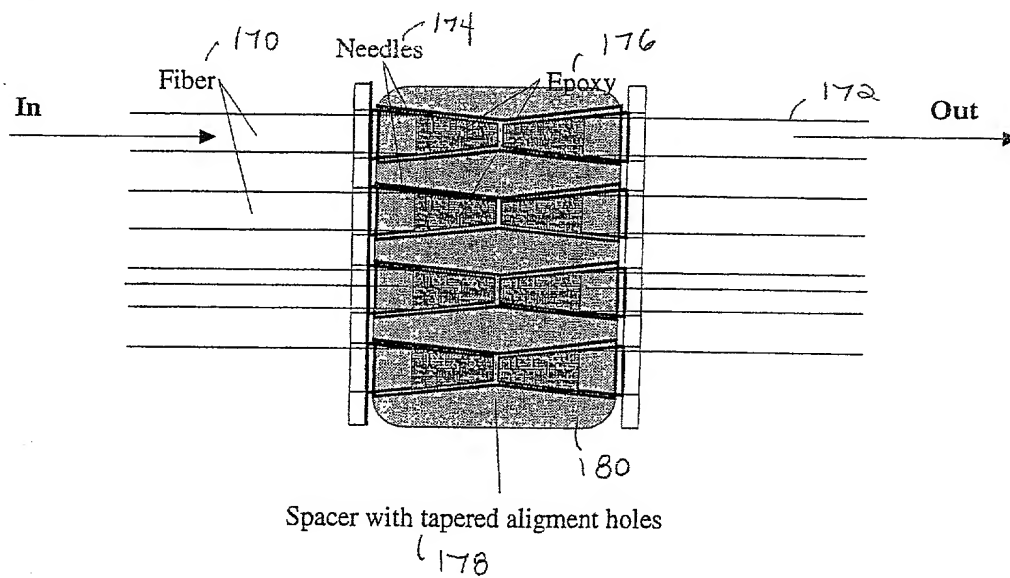


Figure 11

Fiber w/ Sensor Plug

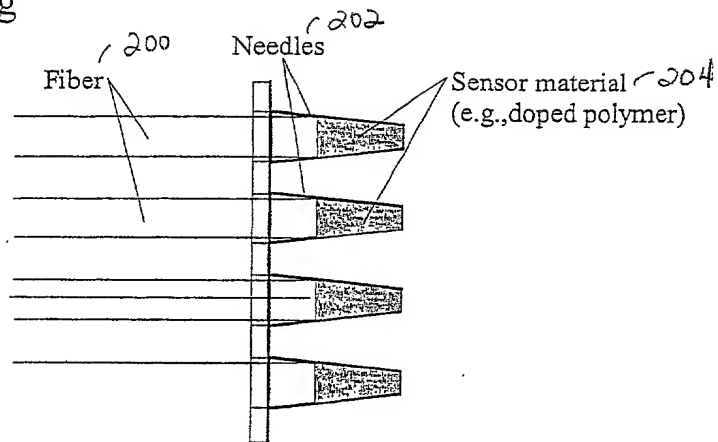


Figure 12A

Fiber w/ lens-shaped sensor element

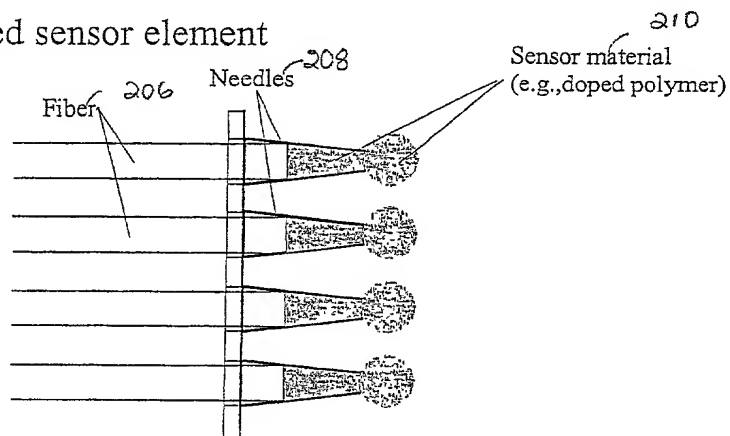


Figure 12B

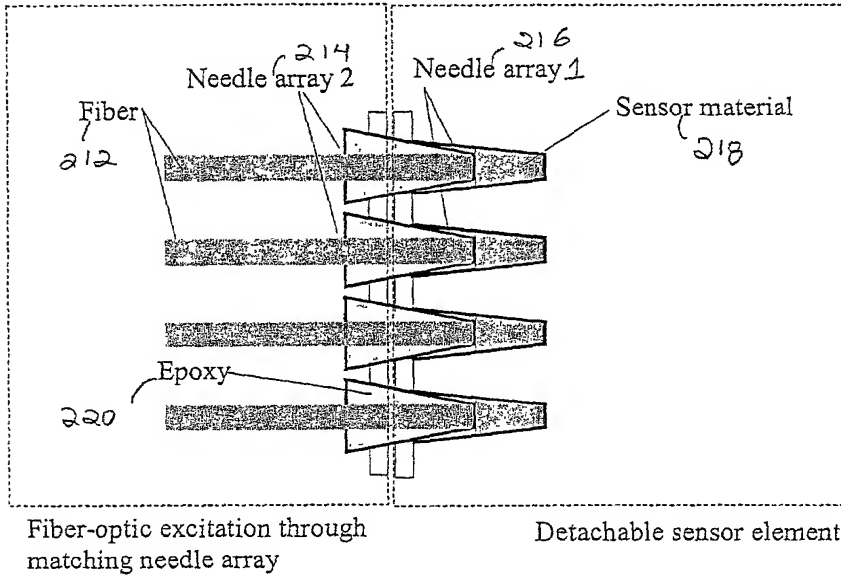


Figure 12C